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CRITICAL ISSUES IN MARITIME TRANSPORTATION(U) NATIONAL
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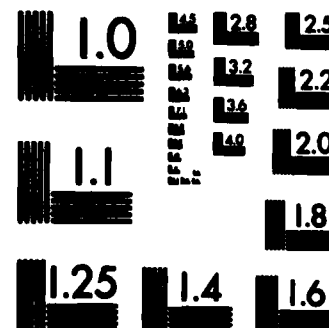
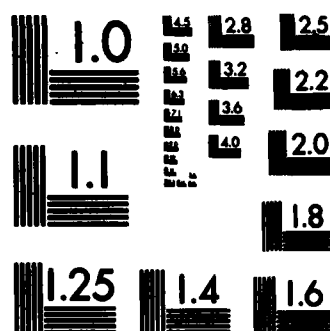
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Issues in Time Transportation

Transportation Research Board
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CRITICAL ISSUES IN MARITIME TRANSPORTATION

1982

Prepared by the
MARITIME TRANSPORTATION RESEARCH BOARD
Commission on Sociotechnical Systems
National Research Council

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PREFACE

The Maritime Transportation Research Board (MTRB) was organized in 1965 by merging two activities of the National Research Council. One predecessor organization, the Ship Hull Research Committee, was formed during World War II as the Committee on Ship Steel to examine the serious problem of cracks in welded ships. The other, the Maritime Cargo Transportation Conference, was formed in 1953 to work on problems of containerization and mechanization. For nearly 40 years the MTRB and its forerunners have been addressing a broad range of problems of significance to the U.S. maritime industry.

As MTRB meets to consider projects appropriate for further study, it must determine the order of importance of these projects. To set such priorities, guidelines are essential. The Congress has established broad objectives for the merchant marine. However, specific programs have not been fully effective in achieving congressional intent. Regrettably, there is no consensus on specific policies, and programs have not been fully effective in achieving the objective. There are, however, a number of recognizable basic issues which would have to be considered in the formulation of a meaningful national program. These issues represent the judgment of the MTRB members based on their professional experience. Consequently, these issues are not the result of systematic research by the MTRB. They can be termed the critical issues in maritime transportation, and in this report MTRB identifies them, along with several related concerns.

The range of issues is broad and the need for further examination is urgent. It is not suggested, however, that all are appropriate for study by MTRB. Issues involving the creation or alteration of basic policy are more properly addressed through the political process. Only those issues whose resolution may be approached through research are suitable for MTRB's consideration. In such cases MTRB could serve as a neutral forum, conducting and evaluating the research associated with the policy issue.

The current critical issues as perceived by MTRB, and presented here, are intended to be of assistance to planners and managers in both government and industry.

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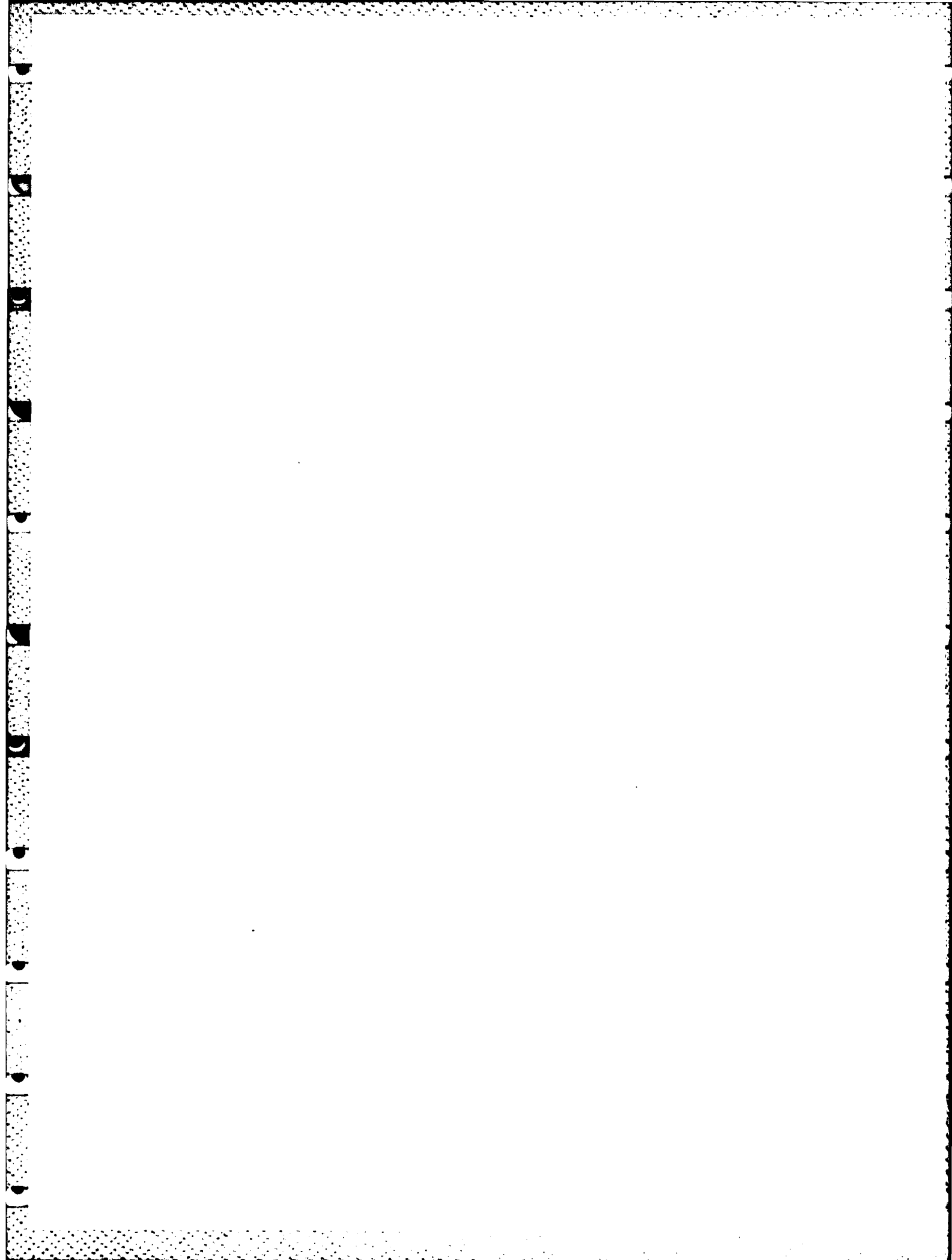
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INTRODUCTION

The U.S. merchant marine is relatively small by industrial standards, but it plays a large role in national and international affairs. In time of war its service is vital. In time of peace it has a positive effect on the nation's balance of payments and economic well-being.

The Congress has mandated that the United States have a merchant marine to carry its domestic waterborne commerce and part of its foreign waterborne commerce, and to serve the armed forces during national emergencies. The mandate is expressed in the Shipping Act of 1916 and the Merchant Marine Act of 1936. This Act and its amendments have established the regulations, financial aids, and promotional programs designed to improve the competitive position of the maritime industry relative to its foreign counterparts.

Congressional intentions and industrial efforts notwithstanding, the stated objectives have not been met. Since World War II, the fraction of the nation's waterborne commerce carried by the U.S. merchant fleet has declined, and the capability of the fleet has declined as well. For many reasons, U.S.-flag ships have serious difficulties competing internationally.

The mechanisms established by the Shipping Act of 1916 may have lost their effectiveness. As a result, the Committee on Merchant Marine and Fisheries of the U.S. House of Representatives has held extensive hearings on the vital issues of shipping conferences, shippers' councils, and bilateral and equal access cargo-sharing agreements.

The Merchant Marine Act of 1936 has also come under scrutiny. The Act was designed to meet the commercial maritime needs of the depression era through two kinds of aid: Operating Differential Subsidies (ODS) and Construction Differential Subsidies (CDS). Since then, the activities, organization, operation, and composition of the U.S. merchant marine have changed substantially, and the fleet faces a different set of problems.

The 1970 amendments to the Merchant Marine Act of 1936 sought to expand and increase subsidies to the tanker and dry bulk segments of the U.S.-flag fleet. However, the amendment did not stop the decline in the size and capability of the U.S. merchant fleet. Its goal of constructing 30 ships per year over a 10-year period was never reached.

The foregoing legislation, designed to increase the proportion of foreign trade carried in U.S.-flag vessels, has failed to achieve stated objectives. The allocation of a portion of government-financed trade has helped U.S.-flag vessels to retain only a small and steadily decreasing tonnage share (currently less than 5 percent) of the nation's waterborne foreign trade.

A number of activities have followed. During 1978-1979, an executive branch interagency task force reviewed federal maritime policies. Though its conclusions highlighted important elements of the decline in maritime capability, little resulted. The Ocean Shipping Act of 1978 and the Shipping Act Amendments of 1979 dealt with certain regulatory matters. However, the prospects for U.S.-flag carriers in the 1980s do not appear bright.

President Reagan has stressed the need for a strong maritime industry. Early in his administration the Maritime Administration was moved to the Department of Transportation, and the Secretary of Transportation was designated the cabinet-level maritime spokesperson. In addition, administration officials are in the process of developing a new maritime program.

Enactment of current administration proposals for increased Navy shipbuilding will have a significant impact on the workload available to U.S. shipbuilders. While this would reverse the current decline in shipbuilding, it would not come in time to offset lay-offs, nor would it support, of itself, the number of shipyards many government officials consider essential for an adequate mobilization base.

Thus, the industry may encounter profound challenges during the 1980s:

- . A rewriting of basic U.S maritime regulatory law
- . The need to increase the competitiveness of U.S. shipping
- . A reduction in or termination of federal maritime subsidy programs
- . An increased concern, both domestically and internationally, with safety
- . The necessity to rebuild old and outmoded fleets
- . The need to maintain an adequate mobilization base of manpower, ships, and shipyards
- . A rebalanced relationship between the defense and commercial sectors
- . The necessity for maintaining or improving ports, harbors, and waterways.

These challenges have led the MTRB to define the ten critical issues described in the next section.

CRITICAL ISSUES

The word "critical" denotes a crisis, a turning point, or a specially important juncture. An "issue" is a matter that is in dispute, unsettled, or about which there is controversy. Thus unresolved subjects which are particularly important to the future of the maritime industry can be termed "critical issues."

The issues facing the U.S. maritime industry range broadly over defense, operations, finance, regulation, people, facilities, and equipment. To provide a framework for description and analysis, these problems are treated here in terms of ten critical issues:

- . Cargo
- . National Security
- . Federal Policies
- . Shipbuilding
- . Productivity
- . Human Resources
- . Maritime Safety
- . Domestic Shipping
- . Ports and Harbors
- . Intermodalism

Clearly, interdependencies exist among these issues, and they are identified in the following discussions. No attempt has been made to prioritize the issues beyond including them in this list of critical issues in maritime transportation.

CRITICAL ISSUE 1

CARGO

Background

The various federal policies designed to foster an effective, economic, and competitive U.S.-flag merchant marine have not been successful. During the past decade, the U.S. merchant fleet has declined to the point where it now numbers fewer than 600 oceangoing vessels.

Concomitant with the decline in the size of the fleet, the proportion of the nation's foreign trade carried in U.S.-flag vessels has also decreased. Less than 5 percent of the nation's waterborne imports and exports, which total in excess of 700 million tons annually, currently move in U.S.-flag ships. Of the cargoes carried by foreign-flag ships, almost 90 percent comprise strategic materials vital to the United States.

The lack of cargoes for the U.S. merchant fleet means fewer ships, fewer trained operating crews, and fewer U.S.-flag ships available for national defense. In times of emergency, U.S. defense and economic security are vulnerable to the policies and political exigencies imposed on foreign-flag ships trading in the nation's commerce.

Points at Issue

The declining economic health of the U.S.-flag fleet requires detailed examination, free of the preconceptions of special interests. Such an examination should consider:

- . What factors underlie the small share of the nation's import-export traffic that is carried in U.S.-flag vessels?
- . What would be the result if joint operating practices were instituted by U.S.-flag vessel operators?
- . What alternative strategies could be developed to increase the amount of dry bulk and tanker cargoes carried by the U.S.-flag merchant fleet?

Critical Issue 1 (continued)

- . What are the advantages and disadvantages of bilateral and multilateral cargo-sharing agreements as means of ensuring cargoes for U.S.-flag ships?
- . How effective are U.S. government supports in promoting increased participation by U.S.-flag vessels in the carriage of foreign trade?
- . Is the U.S. economy more vulnerable because of the nation's growing dependence on a non-U.S.-registered fleet of ships? What are the consequences?

CRITICAL ISSUE 2

NATIONAL SECURITY

Background

The need for U.S. merchant ships to support the nation's defense requirements has been debated since the earliest days of the Republic. As a result of the nation's experience in wars and other past emergencies, this country should maintain a strong capability. However, the cost of providing such a capability has prevented full implementation.

Quantitative national security objectives for the merchant marine are not clear. Perceptions differ among military experts, ship operators, shippers, those charged with maintaining our relations with other nations, and the legal and regulatory community. Moreover, commercial considerations have resulted in merchant ship designs that, in many cases, are not compatible with military requirements.

Points at Issue

The U.S. merchant marine has performed important service in a number of past emergencies. Pertinent questions on the role of the merchant marine in national security today include:

- . How many and what types of merchant ships are required to fulfill national defense requirements, both during periods of emergency and declared war?
- . How can commercial and defense requirements be integrated in ship design?

Critical Issue 2 (continued)

- . To what degree is the foreign-flag, U.S.-controlled fleet effective as an auxiliary merchant fleet during times of emergency or war?
- . What is the value of retaining merchant ships in the National Defense Reserve Fleet and Ready Reserve Fleet for potential reactivation, compared to securing the ships through construction programs, purchases, or requisitions?
- . Can U.S. Navy shipbuilding and conversion programs be used as an incentive for the U.S. shipbuilding industry to incorporate technology-modernization programs? If so, how?

CRITICAL ISSUE 3

FEDERAL POLICIES

Background

As a matter of national policy, virtually all governments provide financial support to their merchant fleets. Direct subsidies, indirect subsidies, and special cargo preference laws are provided by both U.S. and foreign governments. A free market does not exist today as far as the world shipping industry is concerned. Thus, most elements of industry and government agree that some form of aid is necessary if the U.S. maritime industry is to be competitive in international markets.

In addition to financial aid, federal policies impact the shipping industries through regulatory measures. Both U.S. and foreign fleets have been subject to varying safety standards, antitrust constraints, freight rate restrictions, service regulations, and pollution controls. While the U.S. government has tried to impose many of its regulations on foreign operators, enforcement has often been difficult.

The regulatory environment for maritime commerce is in a period of worldwide examination and impending change. Differences will be seen in the reporting of conference activities, in tariff publications, and in the discrimination of tariffs among ports, areas, shippers, or carriers. The conditions under which consultation between carriers and shippers will be permitted may also be changed. In addition, the United Nations Code of Conduct for Liner Conferences would make further regulatory changes in international shipping by reserving shares of traffic between trading countries for their national flag fleets.

Points at Issue

Financial assistance to and regulations of the U.S. maritime industry are political and economic issues. Further, such assistance and regulations have international overtones. There are several questions that should be investigated:

- . How do cargo preference strategies employed by foreign nations compare with U.S. policies?

Critical Issue 3 (continued)

- . What would be the impact of a rapid elimination of Construction Differential Subsidies?
- . Are bilateral shipping agreements practical for the United States?
- . What would be the effect of the UNCTAD proposals on the U.S. maritime industry?
- . What are the relative costs and effectiveness of various federal financial aids, such as direct subsidies, cargo preference laws, tax incentives, and loan guarantees?
- . Are there methods of financial aid that provide incentives for innovation?
- . What would be the impact of allowing volume discounts to shippers similar to those allowed by current rail and motor carrier regulations?
- . How do environmental protection and safety-oriented rules affect the comparative costs of U.S. and foreign shipping?
- . What effect would changes in federal policy regarding the conference system have on the U.S. maritime industry?

CRITICAL ISSUE 4

SHIPBUILDING

Background

The vitality of the U.S. commercial shipbuilding industry depends largely on the shipbuilding orders received from both the U.S. merchant marine and the U.S. Navy. In 1981, a major U.S. shipyard was forced to close its doors to shipbuilding due to lack of orders for new ships. Most of the other major shipbuilding companies have only very small backlogs. In fact, by the end of 1982, only eight merchant ships will be on back-order throughout the entire U.S. industry.

The federal response to this situation has been mixed. Federal policies on the size of the Navy, as expressed in the Navy Shipbuilding and Conversion Program objectives, are somewhat encouraging. The potential impact of this program remains very positive as planned naval work may account for approximately two-thirds of total private sector capacity. However, timing remains uncertain. Further, the FY 1982 budget provided no new appropriations for Construction Differential Subsidies. Furthermore, the FY 1982 Maritime Administration authorization bill permits U.S. ship operators to build their ships abroad and still receive Operating Differential Subsidies. Construction Differential Subsidy funding has not even been requested for the FY 1983 budget.

U.S. companies do not compare well with their foreign counterparts with respect to productivity and cost. Although U.S. shipyards have received substantial federal subsidies, foreign shipyards have also been amply supported by their own governments. Given the level of this government support and their higher productivity, foreign shipyards have quoted prices well below U.S. prices.

U.S. shipbuilders have also had difficulty retaining a stable work force due to poor working conditions, a declining workload, and a relatively low pay scale compared to the aerospace industry and government shipyards.

Critical Issue 4 (continued)

Points at Issue

The U.S. shipbuilding industry should be examined to determine whether it should be revitalized and, if so, how this can be done. This examination should consider such factors as:

- . Can a national policy with respect to the need for a U.S. shipbuilding industry, its size, capability and geographical disposition, be established? If so, how?
- . What measures could be taken by public authorities to help U.S. shipyards become more competitive?
- . To what extent do the requirements of Navy shipbuilding programs render commercial shipyards noncompetitive in merchant ship programs?
- . What are the costs and effects on shipbuilding of environmental protection and occupational safety and health requirements?
- . What should be the response of the U.S. government to foreign countries' subsidies to their shipyards? Should they be challenged, matched, or disregarded?
- . What is the impact of declining merchant ship programs on supporting industries?
- . What factors leading to successful competition by other U.S. industries in international markets are applicable to shipbuilding?
- . How important are improved shipyard technology and modernization in enhancing productivity and reducing costs? Where are the sources of capital for such efforts?

CRITICAL ISSUE 5

PRODUCTIVITY

Background

The U.S. shipping industry must compete in international markets, yet it is at an economic disadvantage compared to most of its foreign competitors. If the industry is to improve its market position, the high costs of living in the United States must be offset by a high level of productivity. This can be achieved through improvements in operating efficiency, manpower utilization, effective use of capital, and technological innovations.

Without such productivity improvements, the cost to the public of the merchant marine will continue to be high, and the merchant marine may not be maintained at a level sufficient to meet defense and economic needs. Even when productivity is improved through technology or new operating methods, foreign competition can also take advantage of the improvements. For example, the U.S.-developed containerization system is now available for all foreign competitors to use. On the other hand, all too often foreign fleets have themselves introduced the technological innovations. In such cases, U.S. companies should quickly adopt the improvements so they do not fall behind.

Subsidies used to lessen the cost disadvantages of U.S. operators have been offset by the financial aids provided by other governments to their own fleets. U.S. subsidies may even have been counterproductive, acting to lessen incentives for increased productivity and placing productivity-limiting operating restrictions on ship operators.

Points at Issue

There are several issues which should be addressed to identify approaches to productivity improvements. If implemented, such improvements could increase U.S. competitiveness in international shipping markets:

- What are the opportunities for and constraints on improved balance in the use of capital, manpower, improved operating methods, and new technology?

- . What effects do the various types of federal aid have on productivity?
- . How can technological improvements be identified and implemented which will increase the competitiveness and operating efficiency of U.S.-flag vessels?
- . What are the impacts of employment contracts on shipboard productivity?
- . What are the advantages and disadvantages of customized ship designs vis-a-vis standardized ship designs in terms of shipyard productivity and ship operating efficiency?
- . Are U.S. shipboard manning levels appropriate with regard to safety, required functions, and the typical manning levels of foreign competitors?

CRITICAL ISSUE 6

HUMAN RESOURCES

Background

The poor economic health of the U.S. maritime industry leaves it poorly equipped to attract, develop, and motivate high-caliber, creative managers. In addition, heavy foreign competition and reduced government financial support will tax the skill of the most able managers.

Furthermore, the declining economic health of the industry will further reduce seagoing and shipyard employment. This can have a serious impact on the quantity of skilled personnel available to the industry. On the other hand, there is substantial room for improvement in the quality of life at sea and in shipyards to attract and retain able personnel.

Given the rapidity and proliferation of change in the industry, it is questionable that current management resources will adequately serve the industry in developing new policies and strategies. Innovation in addition to experience will be required. At the same time, a continuing decline in the total jobs available in the industry makes it difficult to maintain sound training, pensions, and job satisfaction programs.

Points at Issue

The U.S. maritime industry's human resources, both managers and operating personnel, are being severely challenged. The following questions should be addressed:

- . What kinds of and how many managers and technicians will be required in light of changing demands?
- . How can the availability of sufficiently trained operating crews, both licensed and unlicensed, be ensured?
- . What are the most serious problems in recruiting, training, and retaining shipyard workers?

Critical Issue 6 (continued)

- . Where will maritime human resources come from? How can they be recruited, trained, developed, and retained?
- . To what extent can existing personnel be upgraded and retrained?
- . To what extent should management resources from outside the industry be employed?
- . Are changes in shipboard organization, motivation, responsibilities, and man-machine interaction seen as opportunities for, or barriers to, an improved quality of life?
- . Are new forums needed for management and labor to address mutual objectives?

CRITICAL ISSUE 7

MARITIME SAFETY

Background

Maritime accidents of many categories are frequent and affect a high volume of tonnage, despite the safety initiatives of international, national, and local authorities. Moreover, the potential for catastrophic accidents involving hazardous cargoes is increasing. Public bodies have attempted for many years to address these safety problems through regulatory action, primarily focusing on physical solutions to the problems. Extensive research and development has been undertaken in such areas as vessel design, equipment, redundancy, construction, and operation, and yet maritime safety remains far below optimal levels.

Recently, attention has been given to the human aspects of maritime safety. Licensing of seagoing personnel has existed for many years, but only lately has attention been given to the effects of personnel qualifications, training, and experience on safety. Because of the difficulty in addressing these issues, and in some cases the nebulous nature of the problems to be solved, research on the personnel aspects of maritime safety has been sparse, sporadic, and uncoordinated. An integrated approach to this aspect of safety is a principal need of the maritime industry.

Points at Issue

The global shipping recession of recent years has put severe pressure on operating budgets. In consequence, maintenance levels have been lowered in some companies, and experienced senior technical managers have transferred to other fields. These events have coincided with a rise in worldwide casualty rates, suggesting the need to investigate a possible causal connection. In addition, there are other questions that require attention:

- . Can a systematic program for maritime safety, based on reasonable safety objectives and measures for evaluating performance, be developed? If so, how?

Critical Issue 7 (continued)

- . What is the best method to increase the level of safety consciousness within the maritime community?
- . What methods can be effectively used to attack the problems of casualties associated with human failure?
- . What methods can be productive in examining casualties associated with inadequate vessel standards for operating, crewing, and maintenance?
- . How can the needs for vessel traffic control and ship maneuverability improvements be determined?
- . How can information pertinent to the shipboard carriage of hazardous materials be made available to all concerned with carrier and public safety?

CRITICAL ISSUE 8

DOMESTIC SHIPPING

Background

Since colonial times, the domestic shipping industry has played an important role in the United States, moving cargoes along the nation's coasts, on its inland waterways, and on the Great Lakes. The inland waterways provide low-cost, energy-efficient service for bulk chemicals, petroleum products, coal, grain, sand, and gravel. Iron ore, coal, and grain are important bulk cargoes on the Great Lakes. Petroleum products, chemicals, grain, and coal move in large volumes on the coastwise system.

A long series of private and public harbor improvements, lock and dam projects, and channel dredging projects have provided the infrastructure for domestic shipping. Much of this infrastructure is, however, now outmoded, and large investments will be required for necessary improvements. On the inland waterways, old locks impose capacity restraints, as do available facilities at riverfront ports. For coal alone, sufficient facilities will be needed by the year 2000 to handle a projected 130 million tons.

At the same time it is facing requirements for capital investments, domestic shipping is experiencing heavy competition from landside trucks, railroads, and pipelines, as well as high costs of ship replacement and high labor costs. Moreover, waterway user charges were recently imposed on some domestic vessels, and are expected to increase.

Points at Issue

The domestic shipping industry plays a critical role in the nation's economy, especially in moving bulk materials in a low-cost and energy-efficient manner. To ensure its continued health, the current and future problems facing the industry must be examined, including:

- . What are the capacity requirements for the domestic waterways?

Critical Issue 8 (continued)

- . What will be the effect of user charges on domestic shipping?
- . How can adequate sources of funds be secured for funding lock and channel improvements?
- . Are U.S. cabotage laws ensuring adequate and efficient transportation service to the noncontiguous states and Puerto Rico?

CRITICAL ISSUE 9

PORTS AND HARBORS

Background

U.S. seaports are facing challenges arising from such legislation as the Clean Water Act and from innovations in the handling and moving of cargo. Larger vessels designed to reduce unit costs require deeper harbors and ship channels, more maneuvering space, and more sophisticated and capital-intensive port facilities than were needed in the past. Consequently, in many ports, the approach channels and facilities are physically obsolete, inadequate, or unsafe for modern ships.

Harbor dredging and port maintenance are now performed by the federal government, which is considering charging local organizations for the costs of these services. Should the government do so, the economic impact would be substantial, particularly for smaller U.S. ports. These smaller ports are less able to handle the high interest costs and the large capital requirements needed to make major improvements in facilities. The position of the small ports is made even more difficult by the fact that they are facing a declining share of traffic, given that large ships, to maintain their productivity levels, must limit the number of their ports calls.

These limited port calls cause a consolidation of traffic at a few major ports, and give rise to another problem: truck or rail movements to and from terminals can be severely restricted at metropolitan waterfront locations. Ports, as the link between water and land, must have adequate access to land transportation. A bottleneck on either the land or water side of a terminal can severely reduce a port's competitive position.

Points at Issue

The following issues are faced by ports:

- . Are there more economical but environmentally safe methods for disposal of spoil from dredging and maintenance of channels and harbors?

Critical Issue 9 (continued)

- . To what extent should the federal costs of improving and maintaining harbor channels be shifted to nonfederal public bodies?
- . Should local authorities or the federal government have the authority to decide which ports are to be deepened and maintained?
- . If nonfederal interests must pay for dredging improvements and maintenance, should the reimbursement process be based on a port-by-port user fee or a uniform charge imposed and collected by the federal government?
- . Should all users of improved channels pay fees, or only those large vessels carrying commodities which directly benefit from deeper-draft waterways?
- . How could the current lengthy administrative and decision-making processes for approving and funding dredging projects be streamlined?
- . Should federal loan guarantees be provided to local entities for channel-dredging revenue bonds?
- . What are the appropriate methods for dealing with environmental and siting problems associated with petroleum and hazardous-cargo terminals?
- . What are the regional economic impacts and national defense implications of consolidating or relocating ports?
- . What relative effect would user charges have on the traffic, employment, safety, and economics of various ports?
- . What are the long-term impacts of diversion of U.S. cargo to foreign ports?

CRITICAL ISSUE 10

INTERMODALISM

Background

Cargo movements in the past consisted of a series of separate activities. Today, with the advent of containerized cargo operations, cargo movement must be viewed as a system which requires integration to achieve maximum economic efficiency. As an integrated system, goods are transported by various modes in a unified series of ocean and land linkages. These linkages are especially evident in Land-Bridge and Minibridge movements.

The Shipping Act of 1916 provides the basis for regulation of shipping service. As this law was designed for break-bulk cargo, its applicability to containerized cargo operations should now be reassessed. Many participants within the maritime industry consider the law outmoded. Specifically, they advocate the use of intermodal through rates--single rates for combined land-sea movements. The problem which remains is how to regulate and resolve the conflicting interests of the various ports, carriers, and shippers.

Some shippers and port managers are concerned about the effects of the intermodal rates advocated by carriers. The shippers object to adding ocean and inland rates together, without any reductions in the total rates charged or improvements in the services provided. The shippers are also opposed to tying arrangements for the inland portion of cargo movements. Furthermore, there is much disagreement over which federal agency should regulate the intermodal traffic. At present the railroads are regulated by the Interstate Commerce Commission, while the steamships are under the jurisdiction of the Federal Maritime Commission.

Points at Issue

The emergence of cargo movement as an integrated system of ocean and land linkages requires careful assessment of a number of significant questions:

- Who benefits and who is harmed by combined sea-land through services such as Land-Bridge and Minibridge systems, and to what extent are they benefited or harmed?

Critical Issue 10 (continued)

- . Are intermodal or through rates equitable to all parties in the transport system? Do they improve the administrative efficiency of the total land-sea transportation system?
- . Can regulatory responsibility residing in different agencies be coordinated or unified?
- . Do intermodal systems discriminate against certain geographic areas? If so, is this a natural economic consequence of intermodalism?
- . Are current shipping regulations compatible with container and other intermodal systems?
- . Can present container systems be improved? Is container ownership in the proper hands for the most economical system?
- . Are port facilities staying abreast of the needs of intermodal systems?

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